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Reflections

Coping with Abundance: The Burden of Progress in Medical Oncology

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Disclosures: Peter A. Beatty: None.

Medical oncology is a field dependent on and tethered to scientific advances in the biology of cancer. We are not proceduralists. We are not paid to look at x-rays or pathology slides. We do not deliver babies or put patients to sleep. Our job is to attempt to help cancer patients by treating them in a humane and respectful way to improve their quality of life and, hopefully, to extend their lives. This is done in part through rigorous training in medical oncology, but also by applying the best advances in cancer biology to their care in our efforts to help them. If cancer biology does not advance, we cannot improve response rates, disease-free survival times, times to treatment failure, or overall survival times for our patients over what we achieved 5 years or 10 years ago. Those of us who have been observers or participants of the American Society of Clinical Oncology (ASCO) over the years know that sometimes there are exciting new developments to understand and review and then other years are relatively quiet. But, bit by bit, year by year, decade by decade, major advances have occurred and have been translated effectively into meaningful advances for our patients. Some obvious examples are: allo- and autotransplants; the addition of leucovorin to 5-fluorouracil (5-FU), and then a decade later, oxaliplatin; the addition of taxanes to chemotherapy for postoperative breast cancer; growth factors; tyrosine kinase inhibition; receptor binding for vascular endothelial growth factor and epidermal growth factor; and the development of meta-analysis methodology, to name a few. We are privileged to be in a field where knowledge and science are so highly valued. Advances in knowledge and their application to new treatments, however, require thought, confirmation by repeat experiments, and, importantly for those of us who practice, very close attention.

The accumulation of knowledge and clinical advances in medical oncology has not been a continuous process; it has had fast and slow periods. The original clinical experiments in the 1950s with single agents led to a burst of enthusiasm and experimentation in leukemias and lymphomas and some solid tumors. Early successes, however, were followed quickly by relapses, and the early promise of chemotherapy waned. A lull followed until the advent of combination chemotherapy with mechlorethamine, vincristine, procarbazine, and prednisone for Hodgkin's disease and cyclophosphamide, methotrexate, and 5-FU for breast cancer, stimulating hundreds of clinical studies and the birth of ASCO in 1968. Almost 25 years went by during the combination chemotherapy years until cell biology began teaching us about constitutive switching of growth pathways, angiogenesis, and receptor inhibition. Now, in the age of personalized molecular medicine, the accumulation of information has rapidly accelerated to the point where practitioners everywhere are struggling to stay abreast of the meaningful new information and to recognize the failures and therapeutic dead ends buried in the datasets. There is a lot of noise, but relatively few pure notes and melodies for us to listen to.

The information tidal wave became personally relevant for me in early 2010 when I began maintenance chemotherapy in a 73-year-old gentleman with stage 3 squamous cell carcinoma of the left lung and hilum after he sustained an excellent partial response to combined modality therapy with paclitaxel, carboplatin, and radiation. I placed him on pemetrexed. Maintenance treatment had been identified as a strategy in 2009, and pemetrexed appeared to be a well-tolerated agent. However, I missed the publication of the randomized study of the value of maintenance chemotherapy in lung cancer in the *Lancet* in 2009 supporting the use of pemetrexed as maintenance only for nonsquamous lung cancers. I treated him for 5 months before realizing my mistake. Thankfully, he had no complica-

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 1083-7159/2012/$40.00/0 http://dx.doi.org/10.1634/theoncologist.2011-0230

tions and continues to do well. If I had not paid attention to other continuing education sources, I would have overlooked this mistake. Drug label information and indications do not always keep up with meaningful advances in ASCO, European Society for Medical Oncology, and National Comprehensive Cancer Network (NCCN) resources; this discontinuity can put us in awkward situations of both commission (such as mine) and omission, in which we know that there is potential benefit to a particular therapy but cannot pursue it because of a lack of "labeled" indications. Continuous vigilance (in the form of Continuing Medical Education and literature review) is a survival attribute for medical oncologists.

Staying current, therefore, is becoming a burden in medical oncology. Asking that practitioners know the recent advances and standard of care in all the various tumor types is difficult at best, impossible at worst. The only answer to staying current in an era of voluminous information is that we gradually balkanize ourselves into single specialty oncologists seeing only single organ system cancers. That strategy might be feasible in an academic center or very large group, but many of us do not have that luxury. Many of us have to see what walks in the door and enjoy being "generalists"; but in today's information world, it is difficult, if not impossible, to stay abreast of all the advances, as I discovered with my maintenance pemetrexed patient. Those of us in the private world, and especially those of us who network in smaller communities, will have to continue to be generalists, but increasingly we will become second class citizens in oncology because we will not have subspecialization to offer. Consequently, practitioners who can, will begin to limit their practices in order to manage the information overload and to stay competitive with our colleagues.

Mitigating against information overload for all of us are electronic resources that make the world more manageable. Outreach clinics now have the same access to the PubMed and NCCN resources as academic medical centers do, making information and care pathways accessible to all who have the time, patience, and electronic resources to do so. However, as worthwhile and indispensible as these sources are, accessing them can be time-consuming and occasionally frustrating in the middle of a busy clinic. Frustrated practitioners and prolonged patient waiting times do not lead to good patient satisfaction scores.

Thus the exquisite dilemma: we have an abundance of exciting new information that could be potentially transformative for patients, but the amount is so overwhelming that it is easy to miss and thereby potentially harm patients. The other side of this unwieldy coin is the voluminous amount of data we must sift through that is unrewarding or useless from a clinical perspective. This year's ASCO conference had >10,000 paper abstracts for us to digest.

This dilemma is made even worse by the worsening cost issues of contemporary oncology drugs. The unruly, runaway costs of pharmaceuticals make us factor in not only "standard of care" but also the impossible question of whether the treatments are "worth it": does the drug or combination deliver enough value? The value/cost issue ideally should not affect patient care decisions. We are not expected to be health care economists or policy makers, so making judgments concerning the value of treatments is not something in our purview. However, we are the gatekeepers to this field, and if we ignore the huge issue of costs in medical oncology, we will be "part of the problem," rather than "part of the solution." Without our involvement, decisions will be made for us in the future and likely in a manner that restricts choices. These issues are generally far from most patients' thoughts during an office call, but they weigh heavily on most of us physicians as we discuss treatment options.

So, life as a medical oncologist is changing in part for the better, as new advances get unfurled before us and as our patients live longer and better lives, as long as they have insurance to cover the costs. But it is changing also in a more complicated way as the information tidal wave washes over us and we deal with the enormous complexities of cost and value for our patients. It's a tall order for the standard 15-minute office visit.

ACKNOWLEDGMENTS

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